

USSN 10/675,138
Amdt. dated July 26, 2006
Reply to Office action of January 25, 2006

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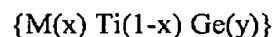
REMARKS/ARGUMENTS

This is in response to the Office action of January 25, 2006 to which a one month extension of time had been requested. The advisory action indicated that the amendment submitted May 10, 2006 was not entered. The advisory action of July 19, 2006 indicated that claim nineteen depended from a cancel claim, namely claim number one. Claim nineteen is now dependent on claim seventeen, an independent claim. Applicant hereby submits a Third Amendment after final. Claim 22 is indicated as "previously submitted." The appeal has been filed and the brief is to August 25, 2006.

Reconsideration of this application is respectfully requested.

Claim 22 has been rejected under 35 USC 102 (e) as being anticipated by U.S. patent 5, 858, 243. This rejection is respectfully traversed. Claim 22 indicates that the material consisting essentially of antimony silicate is doped with tungsten, niobium, and/or tantalum. Such a material is not disclosed in the – 243 patent. That patent could not be described as an antimony silicate because it requires the presence of an alkali metal. In this case it becomes a molecular sieve material as it contains potassium or sodium salt and not an antimony salt.

Further, in reviewing the '243 patent, column 2, the feature of the disclosure that also pertains to the present application relates to a portion of the formula shown in column 2, lines 26 and 54 and in particular that portion of the formula disclosed below.



When the formula is considered, it is respectfully submitted that titanium must always be present. For example, when y is the smallest amount, 0, then M and titanium

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are present in equal amounts. When y however is greatest, 0.75, then Ge plus titanium likewise are there. A review of the working examples of the '243 patent clearly indicates that there is a requirement that significant amounts of titanium must be present in the compounds utilized and disclosed in the '243 patent.

Applicant has previously revised the claims to indicate that the extraction step utilizes a material that consists essentially of antimony silicate doped with one or more elements as is described in the claims. The current independent claims do not include the presence of measurable and significant amounts of titanium or Ge. Since the cited prior art requires significant amounts of titanium and Ge, then it is contrary to the claims of the present application and certainly the present application is not anticipated by the reference.

To emphasize that the presence of titanium inhibits the function of the antimony silicate, applicant has attached a declaration from Alan Minihan. Doctor Minihan has a Ph.D. in chemistry and has worked for some 21 years on the chemistry and structure of inorganic chemicals. He has reviewed the testing that was undertaken during the course of research on this project. Attached to his declaration is a table describing the preparation of various antimony silicate materials that were doped with tungsten and titanium. Paragraph six of his declaration compares the substantially different extraction results outlined in the attached data. As one can see, and as was concluded by Dr, Minihan, (PP. seven) titanium was an undesirable dopant for antimony silicate to be used for extraction of the radioactive metals from acid solution. These test results indicate that titanium is an undesirable material for the claimed antimony silicates. Accordingly

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therefore, claim 22 is not anticipated by the prior reference because titanium is not included in the claims.

It is believed that the submission of the Declaration by Dr. Minihan is timely in light of the Examiner's new rejection under 35 USC 102 (e).

Claims 2-4, 17-19 and 22 are rejected under 35 U.S.C. § 103 as being unpatentable over Bedard (U.S. Patent 5,858,243). This rejection is respectfully traversed. As has been expressed above, the prior art requires the presence of an alkali material. Such material clearly indicates that the prior art is in the nature of a molecular sieve. In addition, the prior art requires the presence of titanium, which is not included in the claims of the present application. As has been shown by the attached declaration of Doctor Minihan, the use of titanium is an undesirable dopant for antimony silicate. Therefore the claimed invention is not obvious.

Claims 7 , 9, 10 , 20 and 21 are rejected under 35 U.S.C. § 103 as being unpatentable over Bedard (U.S. Patent 5,858,243) in view of Dietz (US 5888,398). This rejection is respectfully traversed. As has been indicated above, the — 243 patent, the primary reference, is not applicable to the invention herein. Accordingly therefore, it is not properly combined with the secondary reference. The primary reference requires the presence of titanium. The attached declaration clearly demonstrates that titanium is an undesirable dopant for an antimony silicate that is used to remove radioactive metal ions. Therefore the claimed invention is not obvious.

In light of the above, it would seem that the claims as rejected are in condition for

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allowance.

Applicant includes the arguments that have been submitted previously in this application and does not need to be repeat them again in this amendment.

In view of the above comments, it would appear that the application is in condition for allowance and a notification of allowance is respectfully requested.

In the event that the Examiner does not agree that the claims are now in condition for allowance, he is courteously invited to contact the undersigned at the number given below in order to discuss any changes which the Examiner believes would lead to an allowance of the claims.

Applicant requests that the amendment be entered in order to place the case in condition for allowance or to simplify and clarify the record on appeal. The declaration is being submitted now because of the difficulties in fully communicating with overseas clients and not fully appreciating the examiner's position. Applicant earnestly requests that the amendment be entered not only because the case is now in condition for allowance but because a request for a continuing application had already been filed previously in this matter. Allowance of the claims obviously would control any further costs in prosecuting this case.

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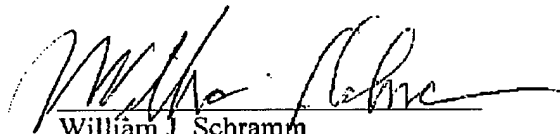
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It is believed that no additional fees are due. Any additional fees which are necessitated by the entry of this amendment may be charged to applicant's attorney's Deposit Account No 50-3865.

Respectfully submitted,

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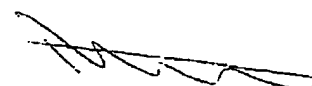
Date: July 26, 2006

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Declaration under 37 CFR 1.132 with regard to US utility patent application number 10/675,138

I, Alan Reginald Minihan, a British subject of 18 Green Lane, Wallasey, Merseyside, U.K. declare the following:

1. I hold the degree of D. Phil. in Chemistry from University of Oxford and the degree of Master of Arts from University of Oxford. I am a Chartered Chemist and a member of the Royal Society of Chemistry.
2. I am presently employed as Group Product Development Manager by Ineos Silicas Limited, Bank Quay, Warrington, UK and have worked for a total of 21 years on the chemistry and structure of inorganic chemicals for Unilever plc, Crosfield Ltd, and Ineos Silicas Ltd.
3. The research work detailed below was carried out as part of a joint BRITE (EU-sponsored) research project (no F14W-CT95-0016) between British Nuclear Fuels Ltd. (UK), Crosfield Ltd. (UK), IVO International (Finland), University of Helsinki (Finland) University of Salford (UK) between 1st January 1996 and 31st December 1998. The table of data, Table 26, annexed to this document is from the final report detailing the work carried out in the project.
4. Crosfield Ltd. changed its name to Ineos Silicas Ltd. on 13th March 2001.
5. Table 26, which is annexed to this document, shows the distribution coefficients (Kd) for various isotopes in acid solution for tungsten (W)-doped antimony silicates (WSS – samples HMS18) in comparison to antimony silicate (HMS10) and titanium (Ti) doped antimony silicate (HMS19). Description of the preparation of the materials tested is also included in table 26.
6. From the comparative data presented in the table it can be seen that the tungsten doped antimony silicates give much higher values for Kd (e.g 702, 8182, 14251-18303 for HMS18a1; i.e. good extraction behaviour) in comparison to the Kd values obtained for the titanium-doped antimony silicate (22, 187, 1.06). It is believed that the test results indicated herein are representative of the testing program, even though there may be other tests, not included herein, that may have been conducted in the time frame of the program.
7. From these data it was concluded that Ti was an undesirable dopant for antimony silicate to be used for extraction of radioactive metals from acid solution and work on this dopant was not progressed.
8. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.



09 May 2006

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Signature.....

Date.....09 May 2006.....

Name Alan Reginald Minihan

Table 26. Distribution coefficients (K_d) for W doped antimony silicates

Sample name	Starting materials	Starting Sb:Si:W ratio	Preparation method	XRD trace	¹³⁷ Cs Kd [mL/g] in 0.1 M HNO ₃	⁸⁷ Sr Kd [mL/g] in 0.1 M HNO ₃	⁶⁰ Co Kd [mL/g] in 0.1 M HNO ₃
1 HMS12 (KSS)	KSC(OH) ₆ , TEOS, HNO ₃	1:1 (weighed)	1% mixture at 77°C, overnight	Amorphous	590	19660	1959
2 HMS10 (SbSI)	SbCl ₅ in 4 M HCl, Na ₂ SiO ₃ (Fluka)	1:1 (0.1 M solutions)	1% mixture at 77°C overnight	Crystalline (as antimonite acid)	1354-3702	35515-102700	1509-4282
3 HMS19 TSS	HMS10+TiCl ₄	1:1:0.61 (sol)	at 60°C, 1d	Amorphous	22	187	1.06
4 HMS17a1 MOSS	HMS12 + NH ₄ (MoO ₄) ₂	1:1:1 (weigh.)	at 77°C, 3 days	Crystalline, AMP	400	363	285
5 HMS17a2	HMS12 + NH ₄ (MoO ₄) ₂	1:1:0.2 (weigh)	-	Amorphous	472	2012	2012
6 HMS17c1	HMS10 + NH ₄ (MoO ₄) ₂	1:1:1:1 (sol)	at 77°C, 2 days	Amorphous	118	141	75
7 HMS17c2	HMS10 + NH ₄ (MoO ₄) ₂	1:2.5:1.7 (sol)	at 77°C, overnight	Amorphous	220	199	116
8 HMS17c3	HMS10 + NH ₄ (MoO ₄) ₂	1:2.5:0.5 (sol)	-	Amorphous	205	118	60
WSS							
3 HMS18a1	HMS12 + Na ₂ WO ₄ ·2H ₂ O	1:1:0.5 (weigh.)	1% mixture at 77°C	Amorphous	702	8182	14251-18303
4 HMS18a1d	HMS12 + Na ₂ WO ₄ ·2H ₂ O	1:1:0.5 (weigh.)	let to dry at 77°C	Amorphous	670	8918	1320
5 HMS18a2	HMS12 + Na ₂ WO ₄ ·2H ₂ O	1:1:1 (weigh.)	at 77°C overnight	Amorphous	272	2489	251
6 HMS18a3	HMS12 + Na ₂ WO ₄ ·2H ₂ O	1:1:2 (weigh.)	-	Cryst. Unknown	85.8 (dissolves)	282 (dissolves)	48.5 (dissolves)
7 HMS18a4d	HMS12 + Na ₂ WO ₄ ·2H ₂ O	1:1:0.1 (weigh.)	let to dry at 77°C	Amorphous	1332	41382	1762
8 HMS18c1	HMS10 + Na ₂ WO ₄ ·2H ₂ O	1:1:1 (weigh.)	20h at 77°C	Semicryst. SbSI	10652	3252	859

9	HMS18c2	HMS10 +Na ₂ WO ₄ *2H ₂ O	1:1:1 (weight)	2 days at 77C	Cyst. SbsI	14441	4608	1552
10	HMS18c2d	HMS10 +Na ₂ WO ₄ *2H ₂ O	1:1:1 (weight)	let to dry at 77C	Cyst. SbsI	17188	35499	1515
11	HMS18c3	HMS10 +Na ₂ WO ₄ *2H ₂ O	0.5:1:1 (weight)	2 days at 77C	Cyst. SbsI	17745	5637	224
12	HMS18c3d	HMS10 +Na ₂ WO ₄ *2H ₂ O	0.5:1:1 (weight)	let to dry at 77C	Cyst. SbsI	20970	8075	640
13	HMS18c4	HMS10 +Na ₂ WO ₄ *2H ₂ O	1:2.5:1 (sol)	1 d at 77C	Cyst. SbsI	15356	9651	611
14	HMS18c5	HMS10 +Na ₂ WO ₄ *2H ₂ O	1:2.5:0.5 (sol)	-	Cyst. SbsI	7008	9492	1101
15	HMS18c6*	HMS10 +Na ₂ WO ₄ *2H ₂ O	1:1:0.5 (weight)	-	Cyst. SbsI	18697	42151	1440
16	HMS18c7d	HMS10 +Na ₂ WO ₄ *2H ₂ O	1:2.5:1.7 (sol)	let to dry at 77C	Cyst. SbsI	6924	5221	289
17	HMS18c8	HMS10 +Na ₂ WO ₄ *2H ₂ O	1:2.5:1.7 (sol)	1 d at 77C	Cyst. SbsI (un?)	3142	435	76.4